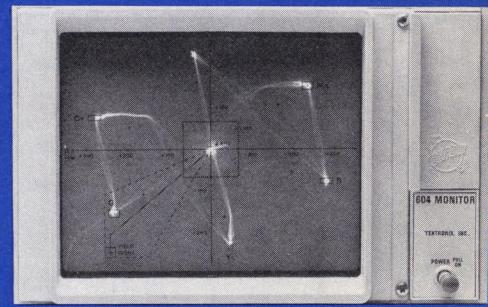
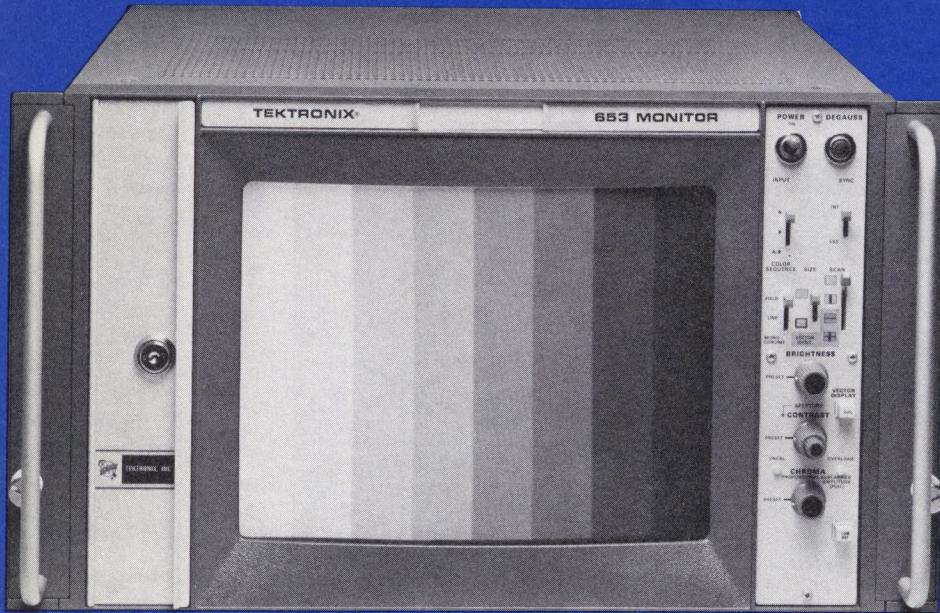


NEW 653 SECAM COLOR PICTURE MONITOR



Color sequencing from field identification signals or the white lead-in signal

Precision decoding allows use of D'_R , D'_B outputs for vector display measurements

RGB inputs (optional)

Precise color tracking over full signal range

Variable aperture correction

Vertical and horizontal delay display modes

Reduced chrominance line crawl

Indicates abnormal chrominance or luminance amplitude

Rapid retrace—entire picture area is displayed in reduced scan

Two switchable inputs isolated from ground for hum rejection

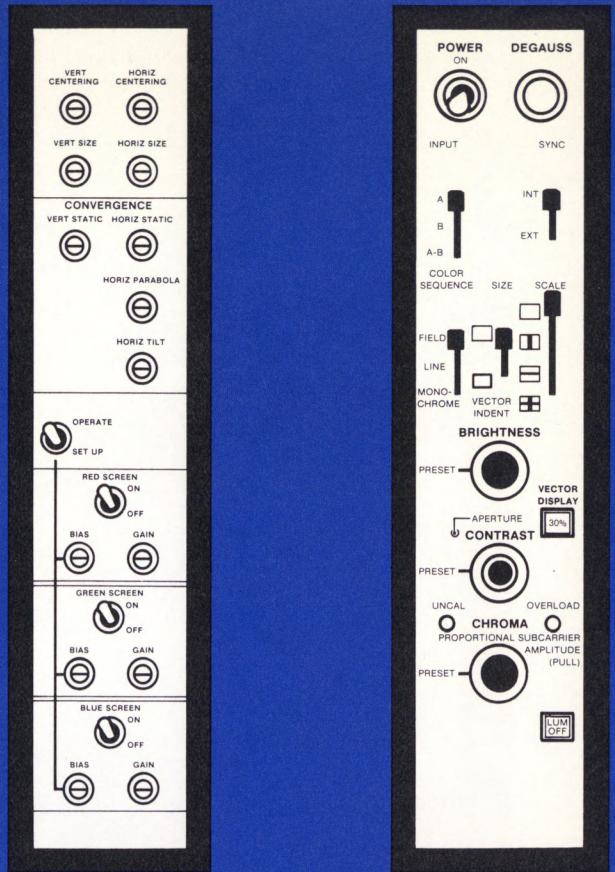
The Tektronix 653 SECAM Color Picture Monitor is designed for use in exacting applications where picture quality is particularly important. Designed for circuit stability and simplicity of convergence, this monitor produces a sharp, accurate picture with consistent color over long periods of time. The 30.6 cm (twelve inches diagonally) Trinitron Kinescope used is free from many of the moire problems of other designs.

The 653 is much more than picture monitor, it also provides unique measurement possibilities. For example, with an auxiliary vector display, encoding tolerances, including white reference quality, are displayed for both 75% and 30% decoded amplitudes. Encoder limiting action on field identification signals is directly observable. The transient behavior of encoders may also be observed.

Another feature of this monitor is its unique ability to display information in the vertical and horizontal blanking intervals. (The usual SECAM monitor is unable to display the vertical and horizontal intervals.) With delay mode displays the 653 enables the user to examine the field identification signals and insertion test signals as well as equalizing pulses, h-sync, v-sync, & half-line chrominance signals. The vertical presentation is expanded when V delay is used to facilitate closer inspection. The intervals remain unblanked in delay modes. Half-line color signals adjacent to the vertical interval may also be displayed.

Left panel—Convergence is simple in the 653. Adjustments are located behind a locked, panel door.

Right panel—Operational controls including those associated with vector displays and delay modes (SCAN).



Color sequencing is front panel controlled by the three-position color sequence switch. In the field mode, field identification is used for color sequencing. Color decoding is enabled by the presence of both field identification signals and sufficient sub-carrier amplitude to represent a valid color source. In the line mode, white reference determines color sequence, and color decoding is enabled whenever detectable SECAM subcarrier is present. Use of the monochrome mode blanks the chrominance channel.

Picture sharpness in the 653 is enhanced by variable-aperture correction which provides improved resolution. You can choose the amount of correction desired with a continuously-variable front-panel control or use a preset position for "no correction" operation. The luminance-channel subcarrier-notch filter is disabled for any monochrome presentation, permitting full 6 MHz luminance channel operation.

Chrominance line crawl is greatly reduced in the 653 by using separate acoustical delay lines—one for red, one for blue. The usual SECAM monitor has only one and chrominance luminance crosstalk often occurs.

Front panel controls are provided to turn off luminance or chrominance. This provides you with operational modes to examine chrominance only or luminance only. Brightness is automatically advanced for easier viewing when luminance is turned off for examination of chrominance. For purity checks the equivalent of a flat-field display can be set up by switching luminance off in a monochrome mode (chrominance off).

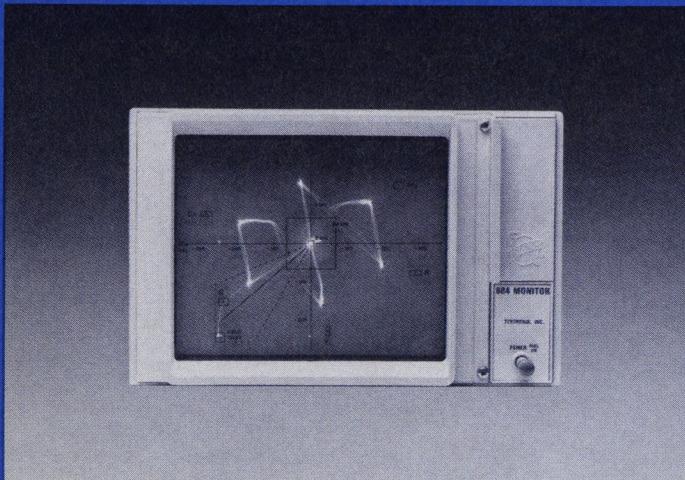
The chroma control has two

operating modes. When the control is in, the chrominance is independent of subcarrier amplitude; when the control is out the chrominance is proportional to subcarrier amplitude. In the latter case, the saturation will vary with incoming video level, whereas in the first case correct saturation will be maintained for varying signal levels. In either mode, both a preset (detent) position and a variable range are available. Switching between the two modes in the preset position provides an immediate indication of abnormal chrominance or luminance amplitude.

Circuits in the 653 are designed for color stability and consistency. The regulated EHT supply is not affected by extreme changes in APL even when calibrated brightness, at peak white, is set at 30 foot-Lamberts. The raster size is held within 1% while excellent clamping maintains black level during extreme APL variations. Retrace in Tektronix color monitors is rapid, less than ten microseconds, allowing you to see the entire picture in the underscan mode.

Two inputs, A and B, are provided for encoded video signals. Used in a differential mode, A-B, the

Vector display, a unique feature of the 653, shows field identification pulse (lower left) and color bars.



653 can be used for timing comparisons between sources. Each input can be isolated from the chassis to prevent ground current-induced hum. Each input is also isolated from all others. Two external composite sync inputs are provided with the capability of automatically switching between two external sync signal sources as the video input is switched, or for obtaining sync for both video inputs from one sync source as desired. All inputs are isolated from each other and the chassis.

All signal connections to the picture monitor are made through BNC coaxial connectors located on the sloping rear panel of the instrument. Two connectors for each input provide compensated loop-through connections so that the instrument may be connected into any part of a 75-ohm system.

Monitors in the 650 Series can be used in rack installations or separately in their own cabinet. They are compact, requiring only 26.7 centimeters (15.72 inches) vertically.

CHARACTERISTICS

CONNECTORS—BNC.

SIGNAL LEVEL—0.5 V P-P minimum composite video; 2 V P-P maximum.

IMPEDANCE—Unterminated: High Z bridging inputs loop-through compensated for 75 ohms (not internally terminated). Return loss: At least 46 dB to 5 MHz, power on or off, input in use or not.

MAXIMUM SAFE INPUT

Exceeds CCIR Recommendation 451.2 (± 5 V peak).

HUM REJECTION—Hum is at least 50 dB down when 4V maximum RMS mains hum signal is applied to the monitor in floating ground mode.

DIFFERENTIAL A-B MODE COMMON MODE REJECTION—46 dB, or greater, up to 4.40625 MHz. Display is in monochrome when A-B is selected.

ISOLATION BETWEEN INPUTS AT 5 MHz

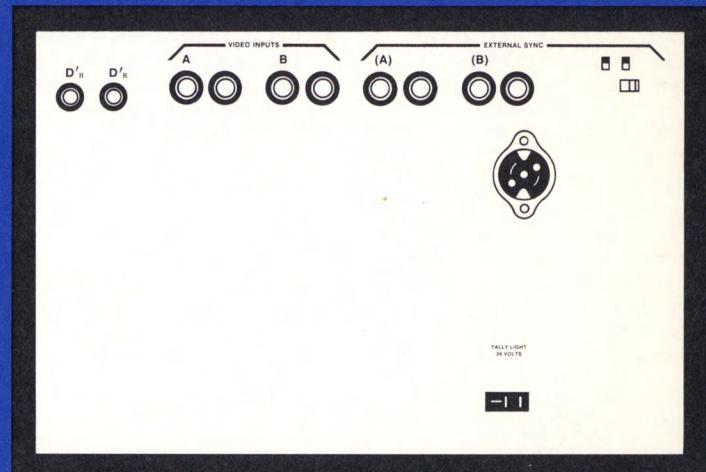
—Signal on Channel A, Channel B Terminated: ≥ 47.0 dB. Signal on Channel B, Channel A Terminated: ≥ 51.0 dB.

LUMINANCE CHANNEL DECODER PERFORMANCE

BANDPASS WITHOUT CHROMINANCE TRAP

(Aperture Corrector Set For 0 dB). Amplitude: ± 0.5 dB to 6MHz. Aperture corrector max

Rear panel.



range— $\geq +8$ dB; double peaked at 2.5 MHz, and at 7 MHz; ≥ 3 dB between 4.0 MHz & 5 MHz.

CHROMINANCE FILTER

Subcarrier rejection: Greater than 25 dB at 4.250 and 4.406 MHz, less than -1 dB at 5.5 MHz. NOTE: The chrominance filter is removed from the luminance channel whenever a monochrome signal is being displayed.

PULSE DISTORTION—Less than 1% tilt on 50 Hz squarewave. Less than 0.5% tilt on 15 kHz squarewave.

DC RESTORATION—Back porch type; not affected by burst. Mains hum reduction due to DC restorer is less than 6 dB.

AMPLITUDE LINEARITY

Within 2%.

LUMINANCE OFF FACILITY

Displays chrominance only and automatically advances brightness.

CHROMINANCE CHANNEL DECODER PERFORMANCE

HIGH FREQUENCY

PRE-EMPHASIS—(Matching to encoder high frequency de-emphasis): Error not greater than 0.2 dB over the range 3.9 MHz to 4.75 MHz; less than 3 dB at 2.850 and at 5.8 MHz.

LUMINANCE REJECTION— >46 dB at 15 dHz.

DRIFT (CENTER FREQUENCY)—Within ± 5 kHz.

LIMITING RATIO—Greater than 60 dB.

LINE MEMORY DELAY

ERROR—Less than 10 ns.

CROSSTALK AT INPUT TO DISCRIMINATORS—Between direct and delayed chrominance signals alternate line crawl on display is minimized through the use of separate delay lines for the D'_R & D'_B chrominance signals.

DISCRIMINATOR LINEARITY—Overall within $\pm 1\%$. Incremental within 1%.

DEMODULATOR CENTER FREQUENCY—Clamped to crystal reference stabilized within $\pm .250$ kHz.

CHROMINANCE SEQUENCE AND COLOR ENABLE—In field mode: Based upon vertical interval reference signals with amplitude disabled when chroma is more than 12 dB low. In line mode: Based upon white reference with no amplitude disabling. An internal jumper provides amplitude disable if required. Chrominance sequence and enable is statistically averaged for best performance in poor signal to noise conditions.

CHROMINANCE UNBLANKING—Programmed internally according to Standard L. Field Identification Signals are displayed in vertical scan delay.

MATRIX

SATURATION—Selectable to treat subcarrier as FM signal or to vary the saturation with incoming chrominance level. Independent of subcarrier amplitude: Gain Error $<3\%$. Dependent on subcarrier amplitude: Tracking error $<5\%$ within ± 6 dB. Chroma control separately adjustable: ± 6 dB.

CROSS TALK—Between R-Y and B-Y <40 dB.

CHROMINANCE/LUMINANCE TIME ERROR— <60 ns with properly adjusted high frequency equalization.

VECTORSCOPE OUTPUTS

CALIBRATION MODES (dots in boxes)—Selected by front panel control on 653 for either 75% color bars or 30% color bars. In vertical delayed scan the vectorscope deflection drive signals will charge to display vertical identification signals.

VECTORSCOPE DRIVE

CAPABILITY—Suitable to drive 10 ft. of 75Ω Coaxial Cable (unterminated) to X-Y display.

REQUIRED X-Y DISPLAY

DEFLECTION SENSITIVITY—0.05 Vols/Cm. on both X & Y axis.

REQUIRED X-Y DISPLAY INPUT RESISTANCE— ≥ 1 megohm.

PICTURE TUBE

HEIGHT—184 mm. (7.23 inches).

WIDTH—245 mm. (9.64 inches).

UNDERSCAN—Approximately 20% reduction in both height and width.

ASPECT RATIO—3:4.

DEFLECTION LINEARITY (VERTICAL AND HORIZONTAL)— $\pm 1\%$ within a central area bounded by a circle whose diameter equals picture height; $\pm 2\%$ outside of the central area.

CONVERGENCE ERROR—Less than 1 mm. within the central

area. Outside of the central area, color separation (misconvergence) is less than 2 mm.

UNBLANKING—All active picture elements are displayed. (Horizontal retrace is accomplished within 10 μ s).

COLORIMETRY—Optimised PAL System I.

COLOR TEMPERATURE—6500°K. Adjustable to other standards.

CALIBRATED CONTRAST

30 foot lamberts at peak white of standard 1 V signal.

E.H.T. (EXTREMELY HIGH TENSION)—19 kV nominal, regulated. Load variations cause less than 1% picture height variation.

KINESCOPE PROTECTION

Failure of horizontal or vertical scanning shuts off the E.H.T. Failure of H.V. Regulator circuit does not cause E.H.T. to soar excessively. E.H.T. supply is current limited.

HEATER VOLTAGE—Regulated DC.

INPUTS, SYNC & TIMING CONNECTORS

SIGNAL RANGE—Negative going. Composite sync 0.5 V P-P to 8 V P-P or composite video 0.5 V P-P to 2 V P-P.

IMPEDANCE—Unterminated: High Z bridging inputs loop-

through compensated for 75 ohms. Terminated: 75 ohms (external). Return loss: At least 46 dB to 5 MHz with respect to 75 ohms.

SYNCHRONIZATION—Line sync white noise immunity is 20 dB. Field sync white noise immunity is 20 dB. Field sync stable with tilt equal to 100% of sync amplitude in vertical blanking. Stable with 140 mv mains hum.

AFC—Two-loop AFC type. Phase corrector: Corrects for phase errors due to side pin cushion correction and other effects within the monitor. Slow AFC: Displays timing errors of incoming sync; Bandwidth is approximately 25 Hz. Fast AFC: Largely corrects for incoming sync errors; approximately 2 kHz bandwidth.

HORIZONTAL DELAY—Approximately 1/4 line.

VERTICAL DELAY—Approximately one-half field; vertical scan is expanded unless underscan is activated.

PULSE CROSS—Displays horizontal and vertical blanking intervals; vertical blanking is expanded unless underscan is activated. All equalizing pulses are displayed. All vertical interval chrominance information can be displayed.

ORDERING INFORMATION

When ordering please use the exact nomenclature as given here

653 SECAM MONITOR

A SECAM/PAL dual-standard 650 SERIES color monitor is available.

All 650 and 670 Monitors are shipped with rackmounting hardware. Cabinet version hardware is also included.

DIMENSIONS AND WEIGHTS

Width 16.75 in, 42.6 cm. Height 11 in, 28 cm. Length 16.5 in, 42 cm

Width 19 in, 48.4 cm. Height 10.46 in, 26.7 cm. Length 18.25 in (includes handles), 46.5 cm. Weight 52 lb, 23.5 kg. Domestic shipping weight 67 lb, 30.4 kg. Export shipping weight 82 lb, 37.2 kg.

POWER SUPPLY

MAINS VOLTAGE RANGE

11V: Within 10% (104 VAC to 126 VAC), 230 V: Within 10% (207 VAC to 253 VAC).

CREST FACTOR—At least 1.3.

LINE CURRENT—1.5 A RMS maximum at 115 V, 60 Hz. 0.75 A maximum at 230 V, 50 Hz. Current is substantially higher during degaussing.

DEGAUSSING SURGE CURRENT—5 A RMS.

POWER CONSUMPTION

150 W maximum, 110 W typical.

MAINS FREQUENCY—48 Hz to 66 Hz.

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